

Amendments to the Drawings:

The attached drawing sheet includes changes to Figures 1-3. In Figures 1-3, a legend “Prior Art” has been added.

REMARKS/ARGUMENTS

In the Office Action of February 17, 2009, claims 1-8 are rejected and claims 2 and 3 are objected to. Additionally, the drawings are objected to. In response, claims 1, 2 and 4-8 have been amended, claim 3 has been canceled and new claim 9 has been added. Additionally, the drawings have been amended and a replacement drawing sheet has been attached. Applicants hereby request reconsideration of the application in view of the amendments and the below-provided remarks.

Objection to the Drawings

The drawings are objected to. In particular, the Office Action states that Figures 1-3 should be designated by a legend such as “Prior Art.” In response, Figures 1-3 have been amended to include a legend “Prior Art” respectively. Thus, Applicants hereby request that the objections to the drawings be withdrawn.

Claim Objections

Claims 2 and 3 are objected to. Thus, claim 2 has been amended to replace the phrase “each spaced region” with the phrase “each of said spaced regions.” Additionally, Applicants have replaced the phrase “each spaced region” of claim 3 with the phrase “each of said spaced regions” and included the limitations of claim 3 into claim 1. As a result, claim 3 has been canceled. Thus, Applicants respectfully request that the objections to claims 2 and 3 be withdrawn.

Claim Rejections under 35 U.S.C. 103

Claims 1-4 and 8 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over acknowledged prior art (APA) in view of Yokagawa et al. (U.S. Pat. App. Pub. No. 2003/0227061, hereinafter “Yokagawa”). Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over APA in view of Hshieh et al. (U.S. Pat. App. Pub. No. 2001/0003367, hereinafter “Hshieh”). Claims 5-7 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over APA in view of Yokagawa or Hshieh and further in view of Hsu et al. (U.S. Pat. App. Pub. No.

2004/0145011, hereinafter “Hsu”). As described above, claims 1, 2 and 4-8 have been amended, claim 3 has been canceled and new claim 9 has been added. Applicants respectfully submit that the pending claims are patentable over the cited references for the reasons provided below.

Independent Claim 1

Applicants respectfully assert that Yokagawa fails to teach that “*mutually spaced regions of the second conductivity type are provided immediately below the intermediate trench portions that are connected to source potential*” (emphasis added), as recited in amended claim 1. Thus, amended claim 1 is not obvious over APA in view of Yokagawa.

Yokagawa teaches that an active region (43) surrounds the side faces and the bottom of each trench (51). (See Fig. 9(b) and paragraph [0101]). Yokagawa further teaches that the active region (43) is made of five doped layers and five undoped layers. (See Fig. 9(b) and paragraph [0102]). That is, Yokagawa teaches that the active region (43) includes mixed doped and undoped layers. Because Yokagawa teaches that the active region (43) includes mixed doped and undoped layers, Yokagawa fails to teach that the active region (43) is of a single conductivity type, i.e., “*the second conductivity type*.” Because Yokagawa fails to teach that the active region (43) is of a single conductivity type, Applicants respectfully assert that Yokagawa fails to teach that “*mutually spaced regions of the second conductivity type are provided immediately below the intermediate trench portions that are connected to source potential*,” as recited in amended claim 1.

Applicants respectfully assert that Hshieh fails to teach that “*each of said spaced regions extends from the channel-accommodating region on one side of a trench to meet the channel-accommodating region on the other side of the trench*” (emphasis added), as recited in amended claim 1. Thus, amended claim 1 is not obvious over APA in view of Hshieh.

In particular, Hshieh teaches that a body region (130) extends a small distance under the bottom of a trenched gate (125). (See Fig. 2 and paragraphs [0014] and [0027]). However, as shown in Fig. 2, the body region (130) does not extend from one

side of a trenched gate (125) to the other side of the trenched gate (125). Because Hshieh teaches that the body region (130) does not extend from one side of a trenched gate (125) to the other side of the trenched gate (125), Applicants respectfully assert that Hshieh fails to teach that “*each of said spaced regions extends from the channel-accommodating region on one side of a trench to meet the channel-accommodating region on the other side of the trench*” (emphasis added), as recited in amended claim 1.

Thus, Applicants respectfully assert that both Yokagawa and Hshieh fail to teach all of the limitations of amended claim 1. Accordingly, Applicants respectfully assert that amended claim 1 is patentable over Yokagawa and Hshieh.

Dependent Claims 2, 4 and 8

Claim 2 has been amended to recite “*each of said spaced regions is an extension of the channel-accommodating region.*” Support for claim 2 is found in Applicants’ specification at, for example, Fig. 6 and Fig. 10, and original claims 2 and 4. Claims 4 and 8 have been amended to correct informalities.

Claims 2, 4 and 8 depend from and incorporate all of the limitations of independent claim 1. Thus, Applicants respectfully assert that claims 2, 4 and 8 are allowable at least based on an allowable claim 1. Additionally, claims 2 and 4 may be allowable for further reasons, as described below.

Claim 2 recites that “*each of said spaced regions is an extension of the channel-accommodating region*” (emphasis added). Claim 4 recites in part that “*the second conductivity type region that provides the channel-accommodating region extends periodically below the trench to form the space regions*” (emphasis added). That is, claim 2 and claim 4 disclose that each spaced region is part of the channel-accommodating region. Applicants respectfully assert that Yokagawa fails to teach the above-identified limitations of claims 2 and 4.

Yokagawa teaches that an active region (43) is made of five undoped layers (43b) and five p-type doped layers (43a), where each of the doped layers (43a) contains aluminum at a high concentration. (See Fig. 9(b) and paragraph [0102]). Yokagawa further teaches that the active region (43) is in contact with a p-type SiC layer (42). (See Fig. 9(b) and paragraph [0101]). Because Yokagawa teaches the p-type SiC layer (42)

and the active region (43) including aluminum p-type layers (43a) and undoped layers (43b), Yokagawa fails to teach that the active region (43) is part of the p-type SiC layer (42). Because Yokagawa fails to teach that the active region (43) is part of the p-type SiC layer (42), Applicants respectfully assert that Yokagawa fails to teach the above-identified limitations of claims 2 and 4.

Independent Claim 5

Claim 5 has been amended to be an independent claim. Support for the amendments to claim 5 is found in Applicants' specification at, for example, original claims 1 and 3-5. Additionally, claim 5 has been amended to correct an informality.

Amended claim 5 includes similar limitations to amended claim 1. Because of the similarities between amended claim 5 and amended claim 1, Applicants respectfully assert that the remarks provided above with regard to amended claim 1 apply also to amended claim 5. Accordingly, Applicants respectfully assert that amended claim 5 is patentable over Yokagawa, Hshieh and Hsu.

Dependent Claim 6

Claim 6 has been amended to correct informalities. Claim 6 depends from and incorporates all of the limitations of independent claim 5. Thus, Applicants respectfully assert that claim 6 is allowable at least based on an allowable claim 5.

Independent Claim 7

Claim 7 has been amended to be an independent claim. Support for the amendments to claim 7 is found in Applicants' specification at, for example, original claims 1, 3-5 and 7.

Amended claim 7 includes similar limitations to amended claim 1. Because of the similarities between amended claim 7 and amended claim 1, Applicants respectfully assert that the remarks provided above with regard to amended claim 1 apply also to amended claim 7. Accordingly, Applicants respectfully assert that amended claim 7 is patentable over Yokagawa, Hshieh and Hsu.

New Claim 9

Claim 9 has been added. Support for claim 9 is found in Applicants' specification at, for example, Fig. 10 and original claim 1.

Claim 9 depends from and incorporates all of the limitations of independent claim 1. Thus, Applicants respectfully assert that claim 9 is allowable at least based on an allowable claim 1. Additionally, claim 9 recites in part that “*each of said spaced regions does not extend into the drain regions of the semiconductor body*” (emphasis added). Applicants respectfully assert that Yokagawa fails to teach the above-identified limitation of claim 9. In particular, Yokagawa teaches that an active region (43) extends into an n-type SiC layer (41). (See Fig. 9(b) and paragraph [0101]).

CONCLUSION

Applicants respectfully request reconsideration of the claims in view of the amendments and the remarks made herein. A notice of allowance is earnestly solicited.

Respectfully submitted,

Huang et al.

Date: May 14, 2009

By: /thomas h. ham/
Thomas H. Ham
Reg. No. 43,654

Wilson & Ham
PMB: 348
2530 Berryessa Road
San Jose, CA 95132
Phone: (925) 249-1300
Fax: (925) 249-0111